

REMARKS

Claims 1-7 are pending in this application. By this Amendment, claim 1 is amended and new claims 6 and 7 are added. Support for the amendment to claim 1 and for the new claims may be found, for example, in Figure 1 and Examples 1-7. No new matter is added. In view of the foregoing amendments and following remarks, reconsideration and allowance are respectfully requested.

I. Rejection Under 35 U.S.C. §103(a)

The Office Action rejects claims 1-5 under 35 U.S.C. §103(a) as allegedly having been obvious over Tagaya in view of Nee. Applicants respectfully traverse the rejection.

A. Claims 1-6

Claim 1 is directed to a rare earth magnet having a protective film disposed on the magnet body. The protective film includes three protective films that are each in a polycrystalline state. The relative spatial arrangements and the relative mean crystal grain size of each of the three films are recited in claim 1. The claimed rare earth magnet exhibits improved corrosion resistance, as described in the present specification.

A protective film having relatively smaller mean crystal grain size has higher density and a reduced number of pinholes than a film having relatively larger mean crystal grain size. Therefore, a film having smaller mean crystal grain size can provide a barrier against external agents that can cause deterioration of a film having larger mean crystal grain size. However, a protective film having smaller mean crystal grain size does not sufficiently improve the corrosion resistance of a rare earth magnet. See page 6, line 23 to page 7, line 4 of the present specification. In contrast, a protective film having relatively larger mean crystal grain size can sufficiently improve the corrosion resistance of a rare earth magnet, but has lower density and a higher number of pinholes. Therefore, exposing a film having larger mean crystal grain size to extreme environments (e.g., severe atmospheric environments where chloride or

sulfurous acid gas is present) causes film deterioration, which in turn, causes decreased corrosion resistance of the rare earth magnet.

Accordingly, in order to exploit the advantages of both film types, the claimed rare earth magnet has disposed thereon a protective film having a three-layered structure, wherein a film with larger mean crystal grain size is disposed in between two films with smaller mean crystal grain size. The larger mean crystal grain size film thus confers improved corrosion resistance upon the rare earth magnet, while the higher density of the smaller mean crystal grain sized films provides a barrier against external film-destroying agents and thus protects the larger mean crystal grain sized film from deterioration. Therefore, the advantages of the claimed rare earth magnet are twofold: prevention of deterioration of the film having a larger mean crystal grain size, and increased corrosion resistance of the rare earth magnet.

**B. The Combined Teachings Of The Applied References
Would Not Have Produced The Claimed Invention**

The Office Action alleges that it "would have been obvious to one skilled in the art to adjust the grain sizes of the Tagaya '756 rare earth magnet protective layers in order to improve mechanical properties as taught by Nee." However, even the combined teachings of Tagaya and Nee would not have produced the claimed invention.

The Office Action relies on Tagaya merely for its teaching of depositing protective film over a rare earth magnet, but indicates on page 2 that Tagaya is "silent in regards to adjusting grain size [of the protective layers] in reduction of the number of pinholes," and relies on Nee for teaching "adjusting the grain sizes...in order to improve mechanical properties." However, Nee also fails to teach or suggest the combination of the features recited in independent claim 1.

Nee describes electrodepositing on an electrically conductive substrate multiple layers of a metal, or an alloy thereof. See Abstract; column 1, lines 15-21; and column 10,

lines 55-60. Each of the multiple layers includes a layer of a first electrodeposited material and a layer of a second electrodeposited material to provide a "sequence of essentially repeating groups of layers." See column 2, lines 34-38 and column 2, lines 64-66. Nee teaches depositing multiple layers of a nickel-molybdenum alloy on a substrate, in which each of the layers is made up of pairs of adjacent layers, "one layer of each pair having a crystal grain size which is substantially smaller than the crystal grain size of the other layer." See column 3, lines 34-39. As shown in column 10, Example V, the grain sizes are adjusted so that the relatively inner layers have a smaller grain size and the relatively outer layers have a larger grain size. Thus, the outermost layer will always have the larger crystal grain size.

Therefore, at most, the combined teachings of Tagaya and Nee would have taught depositing layers having, sequentially, from the magnet body, a smaller crystal grain sized layer, a larger crystal grain sized layer, a smaller crystal grain sized layer, and a larger crystal grain sized layer. However, because the outermost layer disposed on the magnet body would have been a larger crystal grain sized layer, the combined teachings of Tagaya and Nee would not have taught or suggested "a protective film that is in a polycrystalline state and having a *smaller* mean crystal grain size than that of the second protective film forms the *outermost protective film* disposed on the magnet body," as recited by claim 1. Moreover, without a smaller crystal grain sized layer present as the outermost layer to act as a barrier, the outermost larger crystal grain sized layer would not be protected from external film-destroying agents.

Accordingly, because the applied references, alone or in combination, would not have produced the rare earth magnet claimed in independent claim 1, the applied references, alone or in combination, would not have rendered claim 1 or the claims dependent therefrom obvious. Accordingly, reconsideration and withdrawal are respectfully requested.

II. New Claims

By this Amendment, new claims 6 and 7 are presented. New claim 6 depends from claim 1 and, thus, distinguishes over the applied references for at least the reasons discussed above with respect to claim 1. It further distinguishes on the basis that both the innermost and outermost protective films have a smaller crystal grain size which could not occur with the paired layers of Nee. New claim 7 is directed to a rare earth magnet in which the protective film consists of three layers, which also could not occur with the paired layers of Nee. Prompt examination and allowance of new claims 6 and 7 are also respectfully requested.

III. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of this application are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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